

# DESIGNING FOR SMART GROWTH

CREATING GREAT PLACES  
IN THE SAN DIEGO REGION



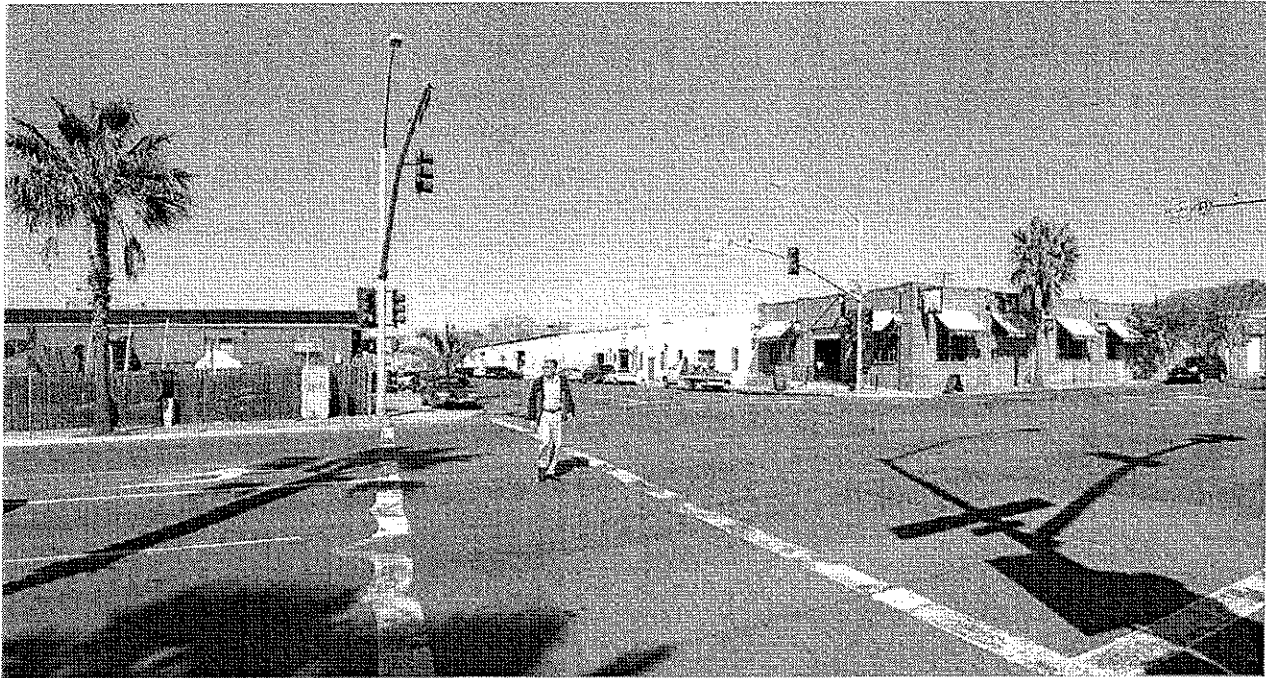
June 2009

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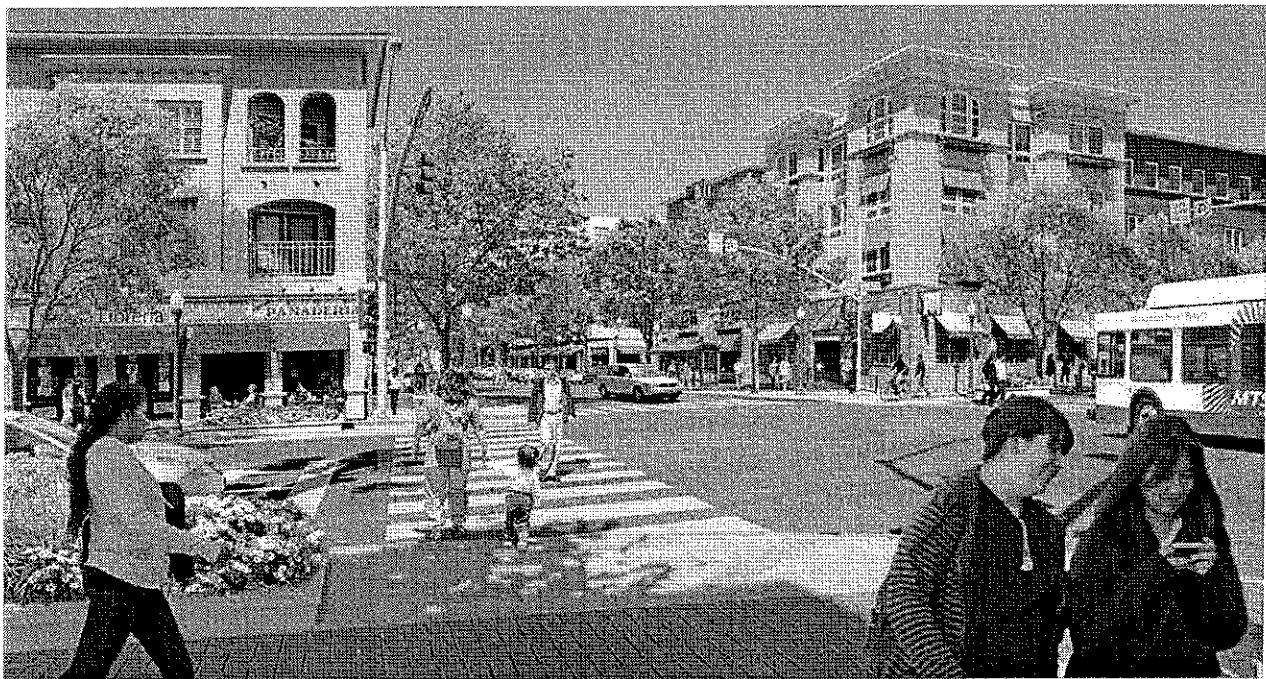
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### 2.4.3 Barrio Logan, San Diego (Community Center)



*Existing:* Part of the Barrio Logan redevelopment project, Main Street, which intersects Cesar Chavez Parkway, is within a block of the Barrio Logan trolley stop, but serves neither as a commercial main street nor as a place that invites trolley ridership. A vacant lot at this prominent corner, along with the low-rise, nondescript industrial design, contribute to a relatively uninviting pedestrian environment.



*Potential:* Street narrowing creates space for attractive street trees and wide sidewalks, encouraging pedestrian activity. Inviting street lamps and outdoor seating further enhance the pedestrian experience. Buildings now face onto sidewalks, often with wide storefront windows and appealing architectural details

#### 2.4.4 Old Palm Avenue and Second Street, Imperial Beach (Mixed-Use Transit Corridor)



*Existing:* This underperforming commercial street has many shallow lots, making it essential to provide on-street parking. However, frequent curb cuts for driveways limit the amount of on-street parking and create a gap-toothed pattern of buildings along the street.

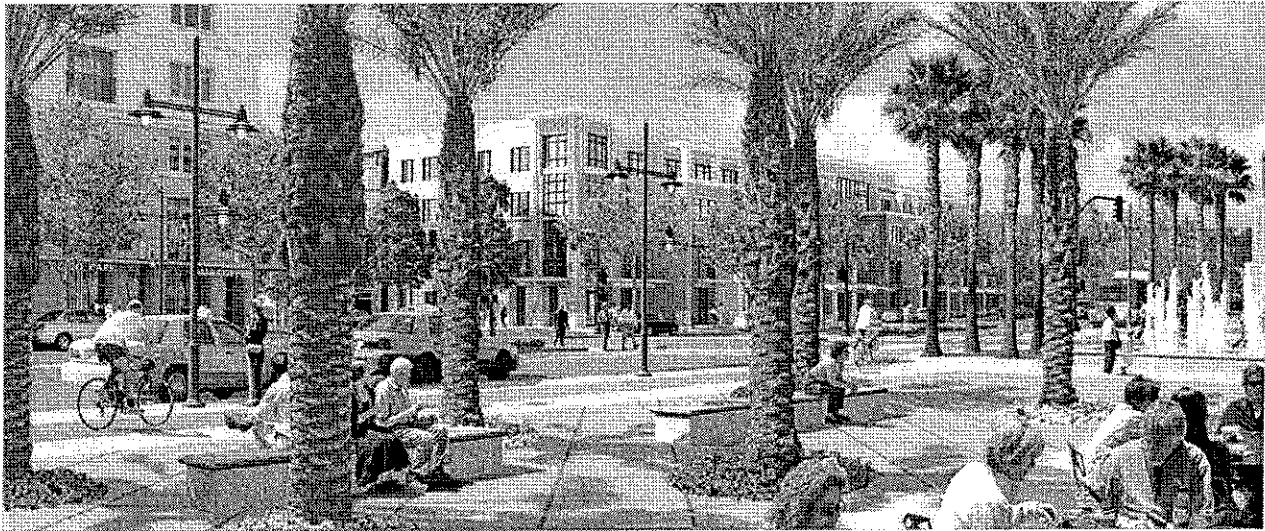


*Potential:* Corner bulbouts, distinctive paving treatments, widened sidewalks and palm trees add visual appeal while creating a better place to walk. Fewer curb cuts means safer sidewalks and space for more on-street parking. Two- and three-story buildings oriented to the sidewalk help to frame this walkable, mixed-use corridor.

### 2.4.7 Escondido Transit Center (Town Center)



*Existing:* The area around the Escondido Transit Center, which faces Valley Parkway, is dominated by surface parking lots that do not support pedestrian activity. This one-way street also lacks a sidewalk on one side and does not have clear places for pedestrians to cross.



*Potential:* Higher-density development is provided to increase transit ridership and transform the Transit Center into a destination. A new plaza, fountain and outdoor seating, along with clearly-marked crosswalks, create a more appealing space for pedestrians.



## CHAPTER 3

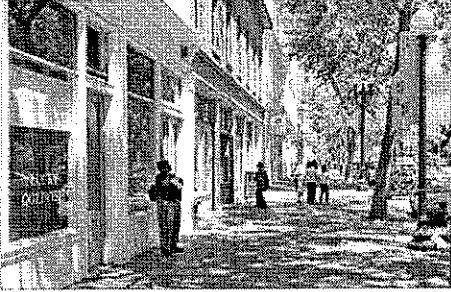
# SITE DESIGN

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Site design is the most basic component of the design process for any development project. It involves fundamental decisions about where buildings are located on a site, how they relate to their surroundings, and where space is provided for pedestrians, vehicles and bicyclists. Private development also shapes the public realm by defining the edges of the street. When new development is planned so that it emphasizes the needs of pedestrians, rather than vehicles, it has the power to reinvigorate the public realm.

## 3.1 Siting and Orientation

A successful site design must coordinate many different activities. Buildings must be located where they can connect to the public realm, but they must also be arranged within the site so that appropriate space is provided for parking, outdoor seating and other activities.

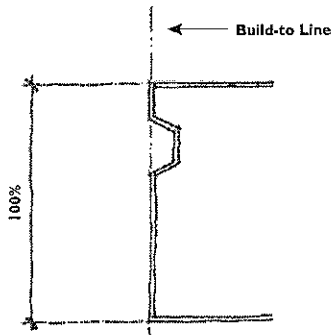


Buildings in Oakland California help to frame the public realm

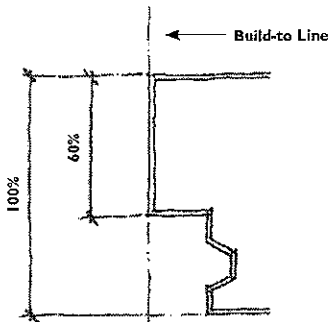
### 3.1.1 Orientation to the Street

Buildings should be highly visible and readily accessible from the sidewalk, encouraging people to walk from place to place.

- ♦ Orient buildings towards the street, so that they frame the pedestrian environment.
- ♦ Do not locate parking between buildings and the street edge
- ♦ Place entrance doors and windows for retail uses fronting directly onto the street at ground level
- ♦ Provide a place to enter the site or building directly from the sidewalk.
- ♦ Provide a high percentage of windows on the ground floor façades of commercial buildings to facilitate greater visual transparency.



On some streets, the entire building should meet the back of the sidewalk except for features such as recessed entrances



On other streets it is appropriate for part of the building to be set back from the sidewalk creating space for amenities such as courtyards and outdoor seating areas

### 3.1.2 Setbacks

Front setbacks or build-to lines set the amount of space, if any, that lies between a building and the sidewalk or street. They define the transition between private development and the public realm.

- ♦ Site buildings at the back of the sidewalk to provide a strong definition of the public realm.
- ♦ Consider setting portions of a building back from the street to create usable outdoor space. To ensure that the setback does not result in an excessive void along the street, use fences, walls, planters or landscaped areas to define the edge of the outdoor space.
- ♦ Where mature trees are present on a site, set back portions of buildings to preserve the trees.



A small setback creates space for outdoor dining at this restaurant in Healdsburg, California

### 3.1.3 Building Mass

A site design must determine how each building's mass—its three-dimensional form—will fit within the site as a whole. The site design must strike a balance that provides a built edge to define the public realm, while not presenting an overwhelming face to the street.

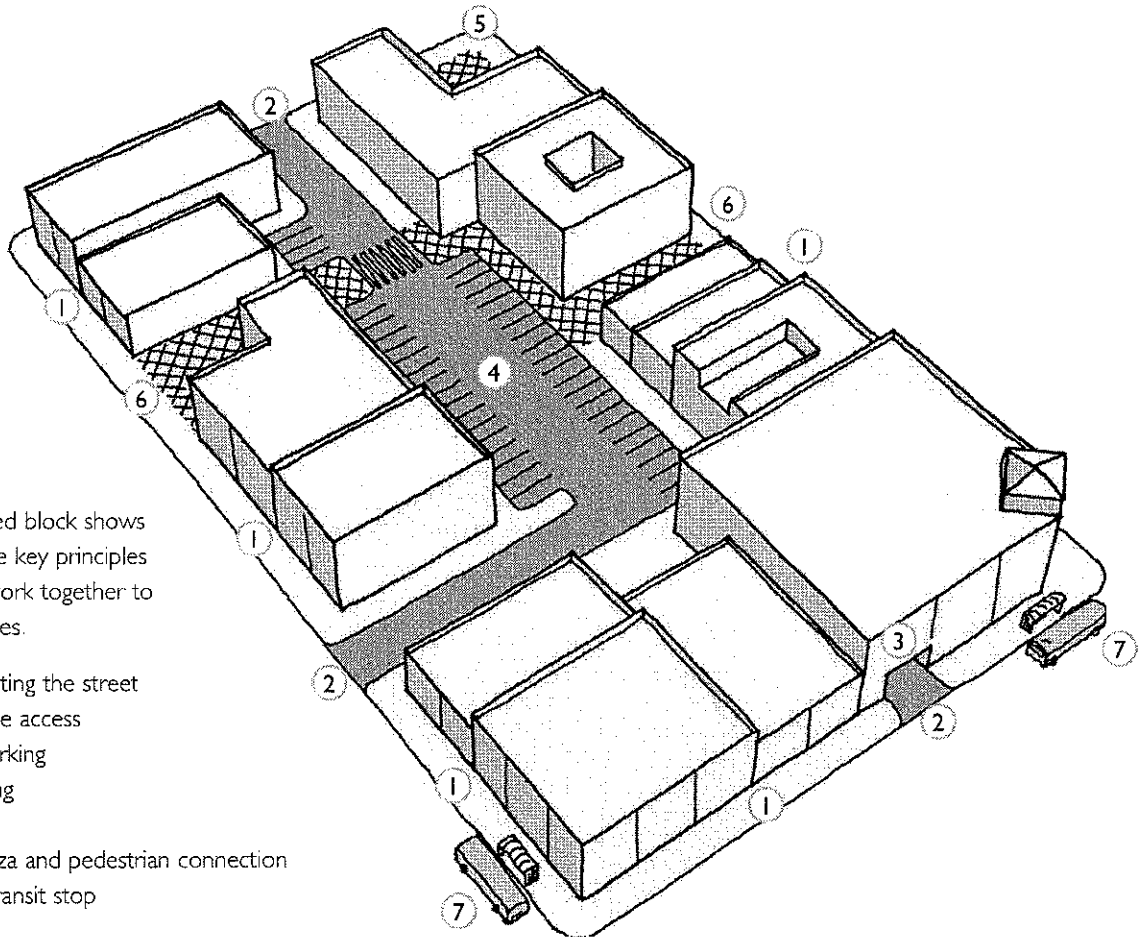
- ♦ Develop a complex of buildings rather than a single large structure. Ensure that the spaces created between buildings can function as pedestrian plazas, courtyards and other outdoor gathering areas.
- ♦ Concentrate a site's building mass at the street edge. For multiple-story buildings, step the building back from the street edge at upper levels to allow sunlight into the street.
- ♦ Place a building's mass so that it responds to the surrounding development. Where necessary, provide a transition that relates to adjacent buildings.

#### See Also

"Change in Development Intensity"  
on page 38



As this building in San Diego becomes taller, it steps back to allow sunlight to enter the street.



This well-designed block shows how some of the key principles in this chapter work together to create great places.

- ① Buildings meeting the street
- ② Limited vehicle access
- ③ Structured parking
- ④ Surface parking
- ⑤ Corner plaza
- ⑥ Mid-block plaza and pedestrian connection
- ⑦ Convenient transit stop



A corner building in Mountain View, California includes design features that highlight the site's prominence.

**See Also**  
 "Plazas and Piazzas"  
 on page 92

### 3.1.4 Corner Sites

Sites gain prominence when they are located at the intersection of two streets. More people pass by corner sites, and the buildings on these sites are more visible. The design of corner sites should acknowledge and celebrate this prominence, and it should help to define the edges of the street intersection.

- ♦ Place buildings located on street corners so that they meet the corner, or use a small setback to provide a public plaza with direct access to the building.
- ♦ Include special architectural and design features on buildings located at corners, such as taller building elements or architectural detail. Additional corner treatments might include a rounded or angled facet on a corner building entrance or an embedded corner tower.
- ♦ Locate the main entrance of corner buildings at the corner, where feasible.
- ♦ Do not establish parking areas at the corner of a corner site. Instead, provide parking behind the building.

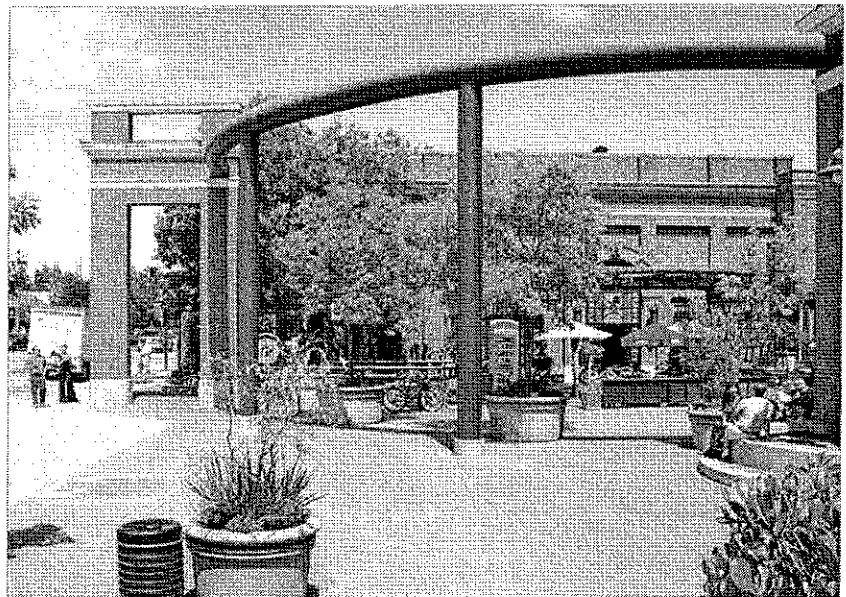
### 3.1.5 Plazas and Open Space

A thoughtfully designed site can include small plazas, courtyards and other outdoor spaces. These spaces can create a visual connection to the public realm as well as a physical transition zone between the building and the street.

- ♦ Integrate semi-public outdoor spaces, such as plazas or courtyards, into commercial development where feasible to help support pedestrian activity and connect to the public realm.
- ♦ Design plazas and building forecourts to maximize circulation opportunities between adjacent uses.



A fountain provides a focal point for this plaza in Cathedral City, California.

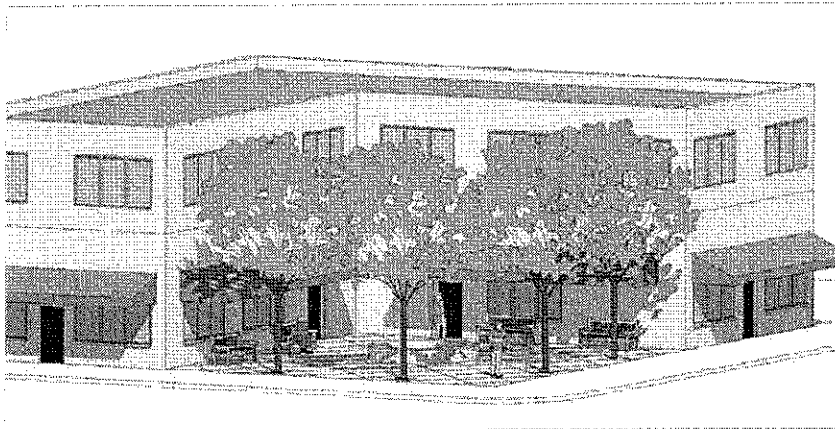


The design of this site in Menlo Park, California, gives shape and character to public space.

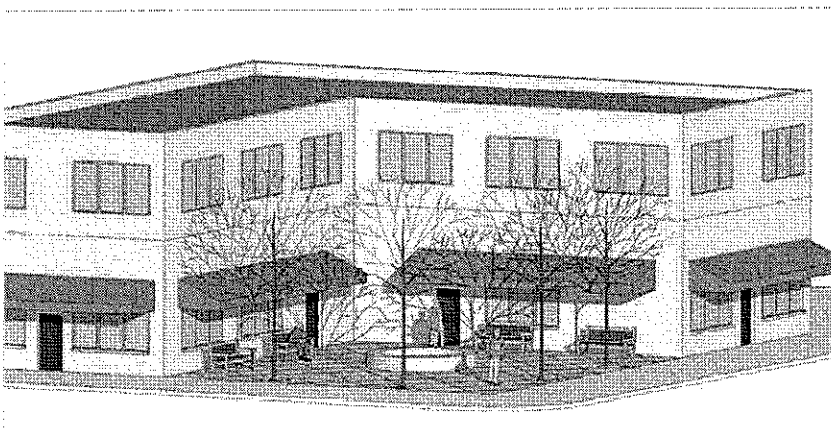
- ♦ Provide landscaping and high-quality paving materials, such as stone, concrete or tile, for plazas and open spaces.
- ♦ Account for climatic factors such as sun orientation and prevailing winds when locating all open space areas.
- ♦ Place outdoor furniture, such as seating, low walls, trash receptacles, bike racks and other elements, in outdoor pedestrian spaces.
- ♦ For larger projects, develop a comprehensive open space network that includes plazas and other open space elements to connect different uses
- ♦ Integrate adjacent land uses on a site into the open space areas and the paths that link them.
- ♦ Site buildings to define open space areas.
- ♦ Ensure that outdoor areas are visible from public streets and accessible from buildings, as well as streets and pedestrian and bicycle networks.
- ♦ Coordinate outdoor furniture with the design of the building.
- ♦ Use drought-tolerant plant materials that are consistent with the architectural design of the building.
- ♦ Use decorative tree grates in pedestrian areas.
- ♦ Where a plaza is adjacent to a parking area, provide landscaping for screening purposes.



A small plaza in Livermore, California, creates a welcoming environment for pedestrians.

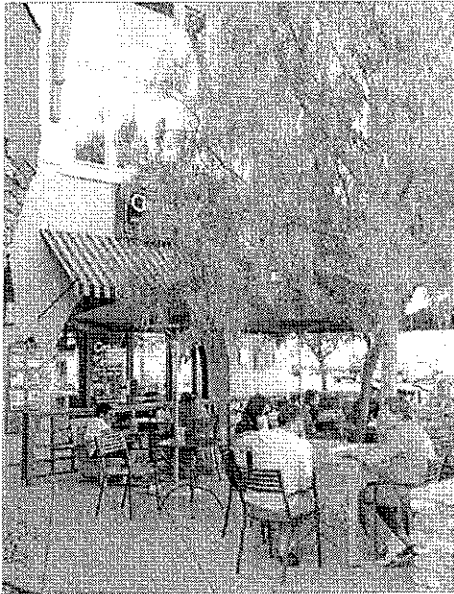


Trees provide areas of shade for a corner plaza in the summer.



Deciduous trees allow for winter sun to penetrate into the plaza space.

See Also  
"Transformation of Existing Places"  
on page 20



A formal seating area in San Diego makes this site more inviting to its users

### 3.1.6 Outdoor Seating

By incorporating outdoor seating, a well-designed site can encourage foot traffic and provide places where people are encouraged to stop and linger. Some outdoor seating areas can be located within the interior of a site, for the enjoyment of people who live or work there. Depending on the site, there may also be opportunities to place outdoor seating closer to the public realm, especially if the site faces a scenic view. Many of the visual simulations in Chapter 2 illustrate how outdoor seating can be incorporated into a site.

- ♦ Incorporate seating into well-trafficked outdoor areas, to maximize opportunities for people to interact.
- ♦ Include formal seating, such as benches and chairs, along with informal seating, such as low walls and stairs, in all outdoor seating areas.
- ♦ Use movable seating where practical so that people can accommodate their own preferences and respond to the weather or time of day.
- ♦ Place seating to take advantage of scenic views towards cityscapes, parks, open space and the coast.
- ♦ Provide lighting to ensure that outdoor seating areas are safe places at night.



An informal seating area in Berkeley, California allows people to stop and enjoy the public realm

## 3.2 Neighborhood Context

Many outstanding communities in the San Diego region contain opportunities for development on vacant or underutilized sites. The design of infill development must be sensitive to the existing neighborhood context and positively contribute to the public realm.



The design of these townhouses in Santa Cruz California helps make them compatible with a nearby neighborhood

### 3.2.1 Compatibility

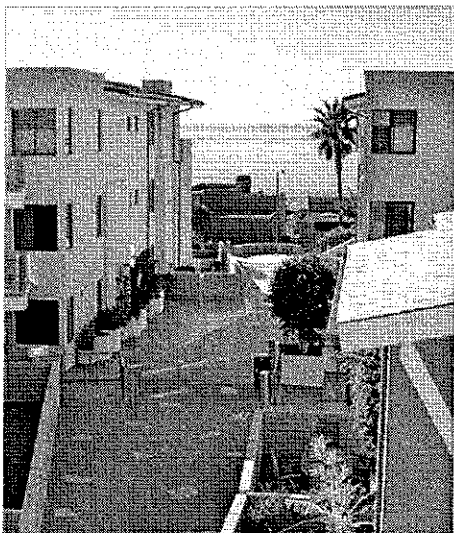
The compatibility of new development with existing development is especially important when new development includes new uses or higher densities. Good site design must carefully balance the need to respond to the existing context with the need to introduce new development that can improve the character and the scale of the surrounding area.

- ♦ Design buildings so that they have heights, massing, setbacks and design character that are compatible with surrounding buildings.
- ♦ Incorporate the area's typical landscape treatments into the site design to connect new development to the existing context.

### 3.2.2 Views

A view of a beautiful or striking landscape feature is a valuable community asset. A view can function as a way-finding tool, as well as influence the identity of a community. New development should capitalize on site-specific opportunities by maintaining existing views and framing new views.

- ♦ Place buildings to frame significant views by ensuring that gaps between buildings provide a view of a significant feature from a publicly-accessible vantage point.
- ♦ Create an interesting focal point on sites that are the terminus of a major visual axis, such as at the terminus of a street, trail or multi-use path.



New development in La Jolla frames an existing scenic viewshed

### 3.2.3 Coordination with Adjacent Properties

Coordination between multiple sites can help to develop a consistent community character. New projects need to consider adjacent sites to identify potential opportunities for the coordination of building programs, site amenities and functional operations.

- ♦ Develop shared facilities such as driveways, parking areas, plazas and walkways in order to increase pedestrian access.
- ♦ Coordinate site designs with existing development on adjoining properties to avoid creating excessive noise or intrusions on privacy, particularly when development is adjacent to sensitive uses such as residential development.
- ♦ On larger sites with multiple buildings, design parking areas and open spaces so they can be shared by several buildings.

**See Also**  
Chapter 9: Parking

## 3.3 Site Access

Vehicle access should not dominate a site, even where vehicle access must be accommodated for parking or loading areas. Pedestrian and bicycle access should be given equal consideration.

### 3.3.1 Building Entrances

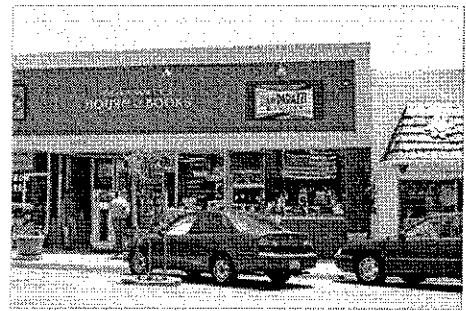
Entrances to buildings are the transition area between the public and private realms; they are highly active places. When entrances to retail businesses are placed where they are visible and inviting to people on foot, they add to the visual interest of the public realm.

- ♦ Orient the main entrances to a building toward a public street, and include architectural features that give them prominence.
- ♦ Locate transit stops, pedestrian seating, bicycle parking and similar amenities near building entrances.
- ♦ Orient the entrances of residential buildings toward the street.
- ♦ Provide multiple entrances into large buildings, such as those that occupy most of a city block or have frontages longer than 150 feet

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**See Also**  
“Links to Transit”  
on page 41

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These closely spaced building entrances in La Mesa are inviting to pedestrians

### 3.3.2 Vehicle Access

While it is often important to allow vehicles to access a site, each access point should be designed to minimize conflicts with pedestrians and bicyclists.

- ♦ Limit access points to the minimum number that is necessary to serve the property.
- ♦ Minimize the width of all driveways. If a driveway must accommodate large vehicles, such as delivery trucks, use the minimum width that can accommodate the effective turning radius of these vehicles.
- ♦ Place all driveways at right angles to the street. Do not include a curb return at the corner of the driveway unless the driveway is signalized.
- ♦ Where possible, provide access to service vehicles through an alley, or through a common access point that is shared with other vehicles.
- ♦ Where a driveway crosses a sidewalk, clearly demarcate the sidewalk across the entire width of the driveway.
- ♦ Indicate major entrances with special design treatments, such as entry signage or distinctive landscaping.

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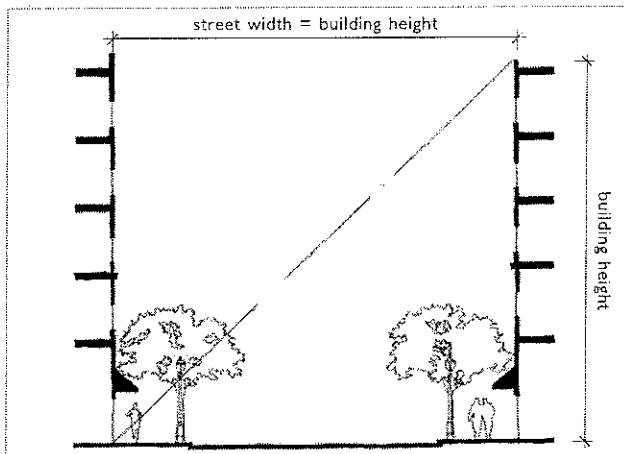
**See Also**  
Chapter 9: Parking

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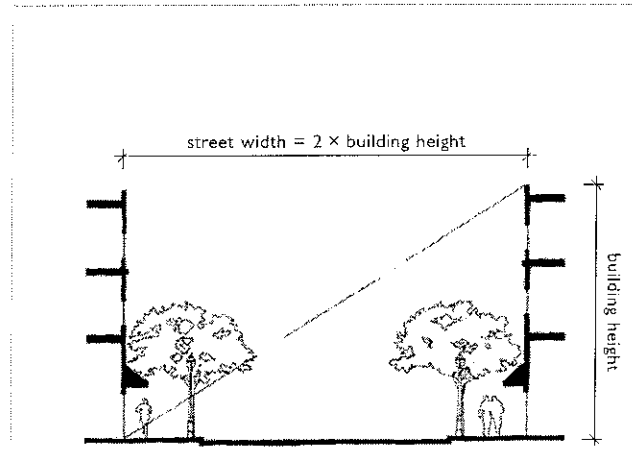
## Change in Development Intensity

Many established communities were originally developed with small, low-rise buildings, at a time when land values reflected their automobile-oriented nature. However, the introduction or expansion of transit in a community represents a significant investment. To ensure that this investment is productive, new development within walking distance of a transit stop must occur at a high enough intensity to provide increased ridership for the transit operator. Communities often grapple with issues related to this increase in development intensity. Concerns about the increase may relate to the height of buildings; the floor-area ratio (FAR) or dwelling units per acre that are allowed; or a combination of these issues.

Over time, many of the properties near a transit stop are likely to redevelop at similar intensities. However, the first project that increases the development intensity on a block or street is likely to draw a great deal of attention, since it represents the most visible change. The following principles and illustrations show how this first project can be designed to win greater acceptance from the community.



A 1:1 ratio of building height to street width creates a well-defined outdoor room

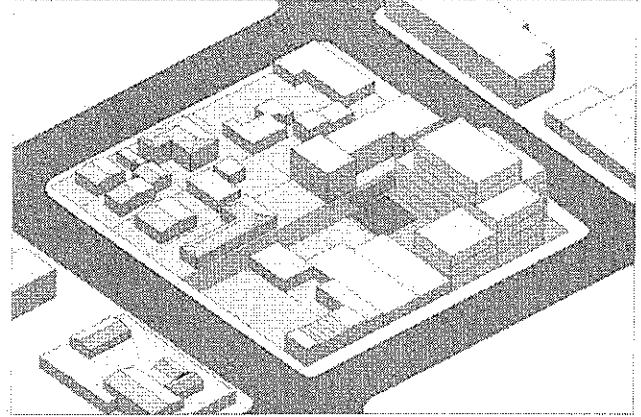
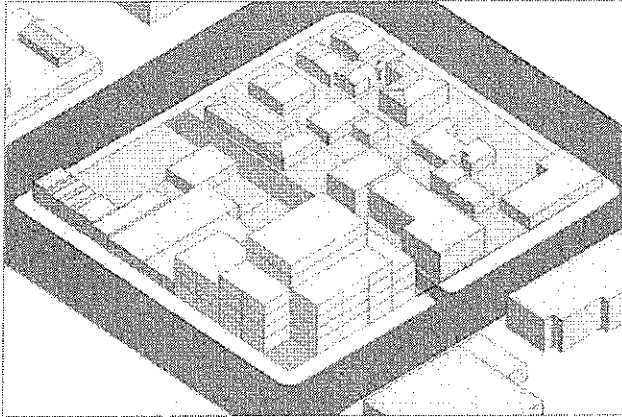


A 1:2 ratio can also create an enjoyable space for pedestrians

- **Street Wall Height.** One requirement for new development in Smart Growth Areas is to enhance the pedestrian environment and promote multiple modes of travel. Therefore, it is important to consider how taller new development shapes the public realm of the street and sidewalk. Research has shown that pedestrians benefit from a sense of enclosure by buildings, creating what is often referred to as an “outdoor room.” As discussed in *Great Streets*, the well-known book by urban designer Allan Jacobs, comfortable and enjoyable street environments typically maintain a ratio of building height to street width—measured from building face to building face—that is between 1:1 and 1:2, as shown above. While this ratio is a good general rule, it may be more appropriate to limit heights further in some special locations—for example, next to open spaces or the coast—in order to create a transition between built and natural spaces.
- **Building Mass.** An important issue for new development introduced into established contexts is its scale. Older communities are often made up of one- and two-story buildings on parcels that are generally 25 to 50 feet wide. New buildings should exhibit massing characteristics that are in keeping with the smaller scale of older development. The diagrams on the opposite page provide some examples of how the building mass of new development can be sculpted to exhibit a contextual relationship with the existing condition.
- **Good Design.** In addition to appropriate street wall heights that reinforce the public realm and massing forms that relate to the existing context, design solutions can solve many issues that arise from increased development intensities. Design that emphasizes a pedestrian scale, quality construction and materials, and well-detailed public frontages will create a greater level of acceptance and satisfaction in established neighborhoods and communities.

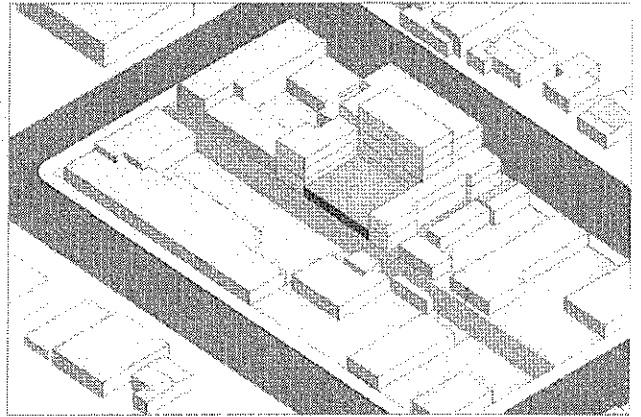
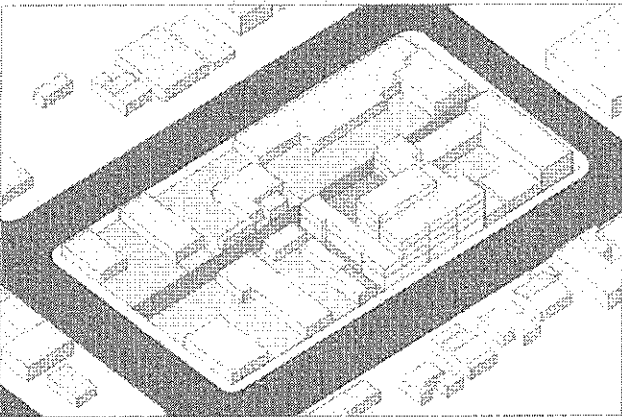
## Examples of Contextual Development in Existing Neighborhoods

### Mixed-Use Building on Corner Site



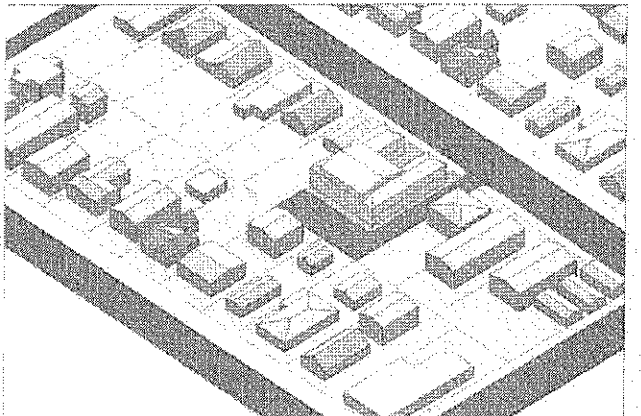
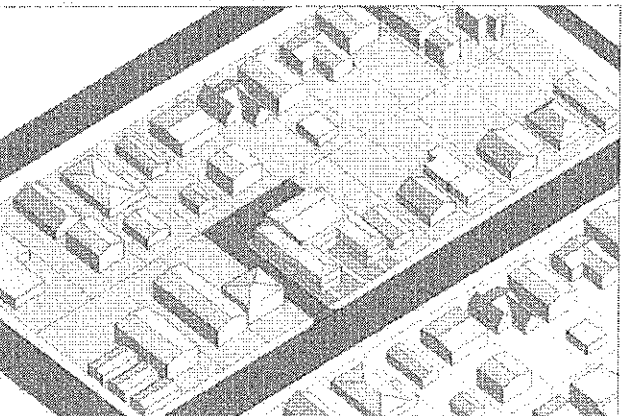
A large corner site provides an emphasis at the intersection of the streets, establishes a street wall and steps the height back on all sides. Podium parking and a small surface parking lot are accessed from an alley.

### Mixed-Use Building on Mid-Block Site



A building on a mid-block parcel on a commercial corridor establishes a good street wall to frame the pedestrian realm. The building is set back from the side property lines to allow for windows, and it steps down to two and three stories at the sides and rear. Parking is provided in the building's podium.

### Residential Building in Single-Family Neighborhood



By maintaining established neighborhood setbacks and providing a series of small-scaled building forms, an 8-unit residence can be appropriately sited on a street that is comprised primarily of single-family residences. A surface parking lot is provided behind the building.



The pedestrian entrance to a site in Oakland California is highlighted by a gateway

### 3.3.3 Pedestrian and Bicycle Access

All sites must provide clear, safe points of access for pedestrians and bicyclists, not just vehicles.

- ♦ On larger sites containing multiple buildings, highlight the site's entrance with design features that create a clear pedestrian path
- ♦ Provide a clear, safe path between bicycle parking areas and entrances from the street

## 3.4 Connectivity

Good connectivity within a site allows people to easily move to and from the public realm. Site planning should increase connectivity by implementing design solutions that maximize access and optimize pedestrian use of new development.

### 3.4.1 Universal Access

New development should be designed for the use and enjoyment of all community members regardless of their physical ability. Universal access can be a challenge in places with significant topography, such as some of the communities in the San Diego region.

- ♦ Connect all commercial buildings to the public sidewalk via a publicly accessible path or walkway.
- ♦ Avoid excessive steps or level changes in primary circulation networks.
- ♦ Utilize materials with flat, smooth surfaces that do not create tripping hazards along pedestrian walkways to and from buildings and parking areas.

### 3.4.2 Pedestrian Connections

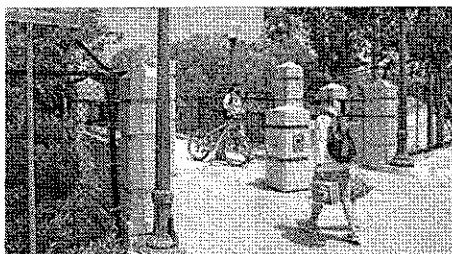
To connect to the street and public realm, new development should be designed with clear pedestrian connections to the sidewalk

- ♦ Provide attractive, well-marked pedestrian links that create a clear path of travel between parking, buildings and sidewalks
- ♦ Include elements such as special paving materials, landscaping, pedestrian-scaled lighting and seating along pedestrian paths and walkways to encourage pedestrian use.
- ♦ Use special design features to increase pedestrian safety where walkways cross traffic lanes. Potential design features include colored or patterned pavement, curb extensions to narrow travel lanes, and low-level lighting such as a bollard light.



Unobstructed pedestrian pathways and sidewalks such as this one in Coronado ensure that community members of all physical abilities can use and enjoy their surroundings

**See Also**  
"Pedestrian Sidewalk Zones"  
on page 65



A pedestrian and bicycle overpass in San Diego creates a connection across a canyon

## Crime Prevention through Environmental Design

Crime Prevention through Environmental Design (CPTED) is the practice of designing sites, buildings and public spaces with the goal of reducing crime, alleviating the fear of crime and improving quality of life. CPTED is based upon the idea of defensible space, developed by the architect Oscar Newman. According to this concept, all space is defended by the people who use it. If a space is defended by legitimate users, it is protected against crime; if a space is defended by illegitimate users, it cannot be used for its intended purpose. The premise of CPTED is that crime and misbehavior can be controlled by designing a space to encourage legitimate use. Today, CPTED principles are employed by planners, designers and law enforcement officers to prevent crime.

Designers can consider the following guiding principles to incorporate CPTED into a site design:

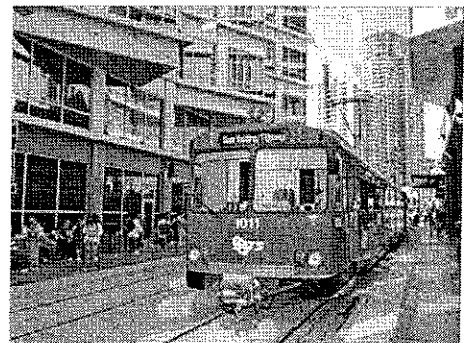
- **Natural Surveillance.** Encourage legitimate activity and provide visual access to spaces, in order to increase the number of people using, watching and caring about the place.
- **Territory Reinforcement.** Ensure that the transitions between private and public space are visible, so that people have an appropriate perception of how spaces are meant to be used.
- **Access Control.** Clearly communicate where people are allowed and not allowed to prevent illegitimate use of a space.
- **Maintenance.** Ensure that development is designed in a way that reduces maintenance needs after construction. Poorly maintained spaces send a signal that the community is willing to tolerate negative activities in these spaces.
- **Appropriate Use.** Utilize design rails and decorative ledges to discourage skateboard use of seating walls. Avoid blank walls that can provide a blank surface for graffiti.

- ♦ Provide shade and landscaping along walkways.
- ♦ Provide design cues along pedestrian connections to help demarcate the transition between public and private spaces. Design cues include a change in colors, materials, landscaping or the dimensions of the space.
- ♦ Provide illumination along walkways that lead to parking areas as well as in the parking areas themselves.

### 3.4.3 Links to Transit

Transit stops should be easy to identify and locate, comfortable and accessible. To provide the best experience and increase ridership, transit stops should be integrated into the public realm. This can be achieved through site design that incorporates the transit facility into public spaces that are adjacent to compatible uses, such as markets, cafés and other services that meet the needs of transit patrons.

- ♦ Place building and site entrances close to adjacent transit stops, and orient buildings to face the transit stop.
- ♦ For public spaces that incorporate transit stops, include multiple areas with direct visual and physical access to the transit line.



Building entrances near transit connections, as shown in this example from San Diego, facilitate movement between the public and private realms.

## 3.5 Energy Conservation and Landscaping



A parking lot in San Diego is shaded by solar panels that provide energy for buildings on the site

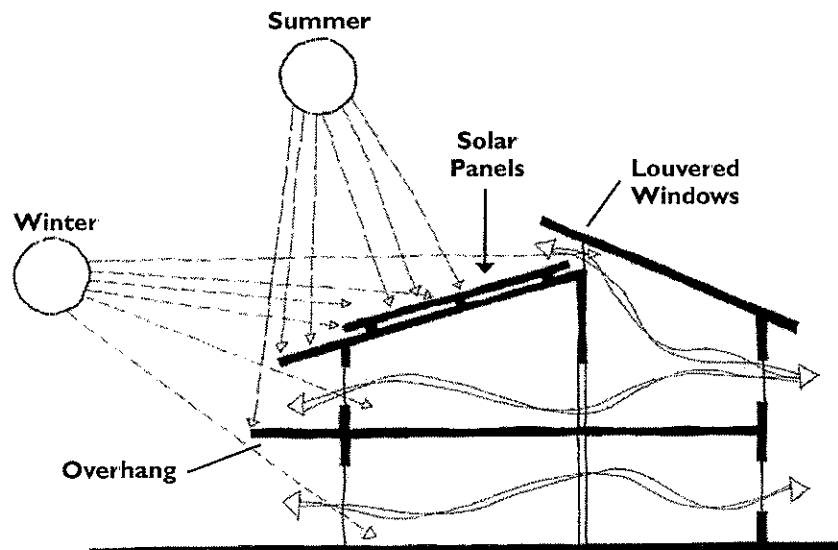
**See Also**  
“Resource Conservation”  
on page 53

Landscaping is an integral part of a site’s design. It has a significant effect on the appearance and comfort of the accompanying space. Incorporating sustainable design practices into the design of a site’s landscaping can help to reduce the consumption of resources, create a more comfortable and livable environment and provide significant savings in maintenance costs. In addition, buildings can be placed within the site to take advantage of the region’s climate.

### 3.5.1 Environmental Influences

Much of the San Diego region has a semi-arid Mediterranean climate, with ample sun and little rain. Well-planned sites can take advantage of this climate by orienting buildings so that they can be lit during the day by sunlight, rather than artificial light. Sites can also incorporate energy-generating technologies, such as solar panels and turbines that capture sea breezes and the seasonal Santa Ana winds. Shaded areas should also be available for the comfort of people sitting outdoors.

- ♦ Orient buildings to the sun to provide natural heating and daylighting and maximize energy efficiency.
- ♦ Take advantage of natural winds by placing buildings so that door and window openings are oriented to the prevailing wind direction.
- ♦ Plant shade trees where they can provide natural shading and cooling for buildings.
- ♦ Incorporate solar panels, other photovoltaic systems and wind turbines into sites and buildings where practical.



Orienting a building to the sun and prevailing winds can reduce heating and cooling costs by taking advantage of winds and natural light

### 3.5.2 Landscape Design

A site's landscape design is an integral part of the overall site design and should be used to integrate development into its setting, rather than to camouflage it. The function of landscape materials should be considered before they are incorporated into a site design to ensure that the chosen materials create an aesthetically pleasing and comfortable environment.

- ♦ Use landscaping at the edges of paths, plazas and seating areas to help define the spatial organization of the site.
- ♦ Use a hierarchy of planting sizes and materials to mark the transition between the horizontal ground plane at the sidewalk or parking area and the vertical frontages of buildings.
- ♦ Use landscaping to activate building facades, soften building contours, highlight important architectural features, screen less attractive elements, add visual interest and provide shade.
- ♦ Maintain landscaped areas regularly to keep landscapes aesthetically pleasing, and to remove dead and dying plants that could create a fire hazard.
- ♦ Regularly thin the ground-level plantings below tree canopies to reduce the "fuel ladder" effect during wildfires.
- ♦ On slopes, provide space between tree canopies to limit the risk of fires that jump from tree to tree. The appropriate spacing ranges from 10 feet on shallow slopes to 30 feet on very steep slopes.
- ♦ Accent gateway or entry points with distinctive trees and plants.

### 3.5.3 Heat Island Effect

The foliage provided by trees and shrubs helps to reduce the heat island effect, a condition in which air and surface temperatures are higher in a localized area than in adjacent areas. This difference in temperature is due to a number of factors, including a reduction in the amount of shade, an increase in the amount of heat-absorbing surfaces and the accumulation of waste heat from cars and energy consumption. Appropriate landscape coverage can reduce the heat island effect. Plants also contribute to cooling the air through the evaporation of water from their leaves, resulting in a more comfortable pedestrian environment and decreased energy consumption.

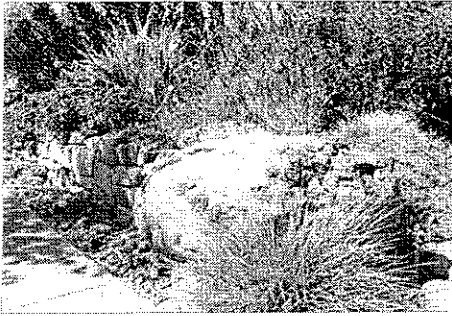
- ♦ Plant trees and vegetation that will provide significant amounts of shade in areas with large heat-absorbing surfaces, such as parking lots.
- ♦ Use trees and shade structures, such as trellises, to shade plazas, sidewalks, parking areas and buildings in order to reduce heat gain and create a more pleasant pedestrian environment.
- ♦ Choose trees with a broad, leafy canopy to provide adequate shade for sidewalks and buildings.
- ♦ In paved areas, use materials with high solar reflectance, such as light-colored concrete, that reflect solar energy rather than absorbing and re-radiating it.



Landscape design enhances public space and softens the edges of these apartments in San Diego



A new development in La Jolla's Bird Rock neighborhood reduces the heat island effect by incorporating new trees and landscaping, utilizing shade structures and incorporating solar-reflective materials.



Landscaping in the San Diego region should use plants that are adapted to the area's limited annual rainfall.

### 3.5.4 Climate-Appropriate Plant Materials

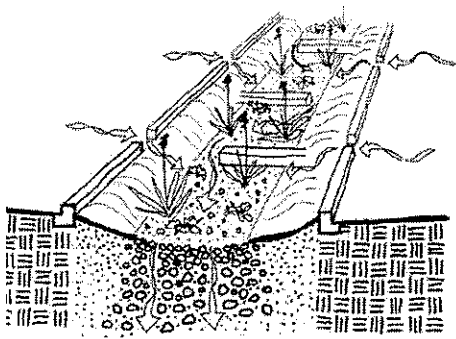
The San Diego region has an exceptional climate with little rainfall. Because water is precious in the region, landscaping should make ample use of native plants and other plants with low water requirements. It is also important to choose plants that help to reduce fire hazards, especially in parts of the region that are prone to wildfires.

- ◆ Choose plants that are suitable for the climate of the San Diego region. Use native or other climatically appropriate and drought-resistant plants.
- ◆ Within 30 feet of buildings, maintain an irrigated zone of low-growing, fire-resistant plants.
- ◆ Avoid plants that are highly combustible or create large amounts of fuel for fires.
- ◆ When choosing street trees and other shade trees, consider the functional and aesthetic benefits of shade trees as well as the need to conserve water. Choose species that can thrive with moderate irrigation once they are established.
- ◆ Minimize the amount of turf in landscaping, or consider turf alternatives. Turf lawns use significant amounts of water and have high maintenance demands that contribute to air pollution and greenhouse gas production.
- ◆ Design irrigation systems to provide different zones of irrigation, or "hydro-zones," based on the water requirements of different types of plants.
- ◆ Limit the use of overhead irrigation spraying. Use drip irrigation specifically directed to where water is needed.
- ◆ Include irrigation controls that regulate the use of irrigation in response to rainfall.
- ◆ Irrigate plants at night or early in the morning to minimize water loss due to evaporation.
- ◆ Provide 2 to 3 inches of mulch on plant beds to help them retain moisture.
- ◆ To control disease, invasive plants and pests, use integrated pest management techniques such as introducing natural predators, planting species that will attract beneficial insects and installing mechanical trapping devices for pests.

### 3.5.5 Green Stormwater Solutions

Incorporating methods to reduce stormwater runoff and including design interventions to capture, clean and recycle stormwater runoff creates multiple benefits, including reducing impacts on stormwater infrastructure and recharging groundwater.

- ◆ Incorporate design features such as cisterns to capture, store and reuse stormwater.
- ◆ Use permeable paving materials for streets, sidewalks, parking lots and driveways.



Vegetated swales can be used to detain and infiltrate stormwater runoff.



## CHAPTER 4

# BUILDING DESIGN

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Quality building design ensures that individual development projects contribute to the overall character of a community, particularly the public realm. Buildings need to be designed to facilitate pedestrian activity and access to transit facilities. Buildings should also include architectural features that reflect the local vernacular and are appropriate to the local climate. This chapter provides guidance for building design that responds to the local context and encourages further high-quality development

## 4.1 Building Frontage

A building's frontage shapes the public realm. A well-designed and thoughtfully proportioned building frontage that uses appropriate architectural detail provides visual interest and contributes to a community's character.

### 4.1.1 Building Rhythm

The rhythm of building façades along a street front can create great visual interest and activate the pedestrian realm.

- ♦ Establish a rhythm on building façades that is small-scale, with individual building bay widths of 25 to 50 feet.
- ♦ Design each building with varying wall planes, heights or contrasting materials to break up visual mass and avoid large, featureless structures.
- ♦ In residential buildings, use changes in massing and detailing to provide identifying features for individual units, where appropriate. Features that may be appropriate include bay windows and recessed elements.
- ♦ Use contrasting colors, a family of window sizes and architectural ornamentation to establish a rhythm to a façade and street frontage.



A residential development in San Diego uses varying wall planes and bay windows to create a rhythm on the building's façade

### 4.1.2 Multiple-Tenant Spaces

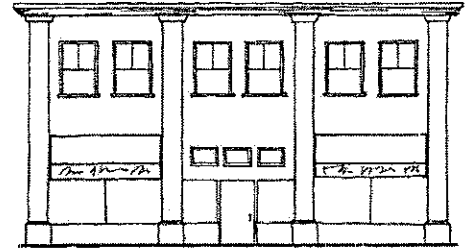
Where multiple-tenant spaces are incorporated into a building, individual tenant spaces should characterize a building's bays, or structural elements.

- ♦ Use columns, piers or pilasters to differentiate the façade's horizontal elements.
- ♦ Incorporate vertical slots or recesses between horizontal façade elements.
- ♦ Vary the building façade by recessing the storefront entrance or creating a niche for the interior use to expand onto the sidewalk.

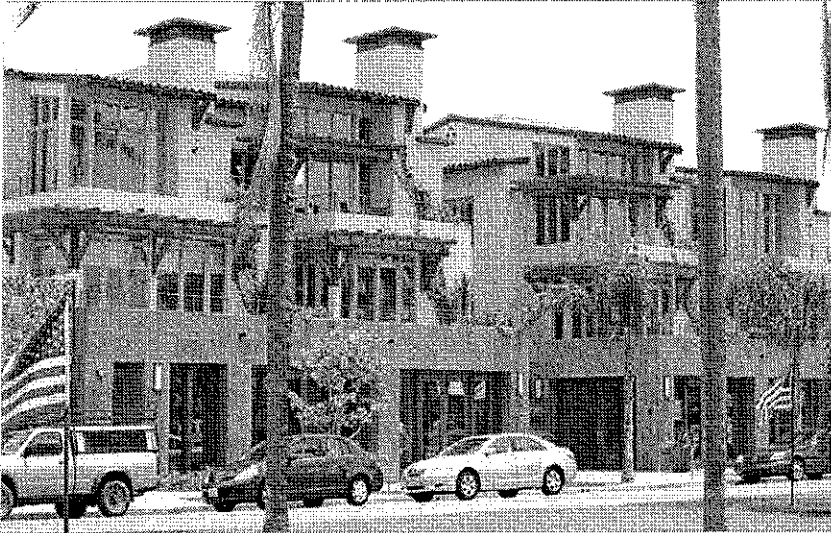
### 4.1.3 Mass and Proportion

The mass of larger buildings should be broken into proportional components that more readily relate to the human scale.

- ♦ Subdivide horizontal mass into portions or segments compatible with the scale of adjacent buildings.
- ♦ Employ vertical architectural elements such as columns, piers or pilasters to subdivide buildings into smaller increments at the ground floor and upper stories.



Vertical architectural elements subdivide the mass of a building into smaller increments



Dividing the horizontal elements of this building in Coronado helps it relate to its surroundings and the human scale

### 4.1.4 Building Façades

A building's façade, and the level of detail to which it is designed, plays a significant role in shaping the public realm and encouraging pedestrians to use the sidewalk.

- ♦ Design the façade to have a distinct base, middle and top.
- ♦ Design building façades to include details that add visual interest, distinctiveness and human scale.
- ♦ Establish depth and shadow by incorporating features that project from the building face, such as window bays and pilasters.
- ♦ Provide building reveals, or offsets in the wall plane, such as entryways and recessed windows.
- ♦ Design façade details that are integral to the architectural and structural design of the building and not tacked onto the surface

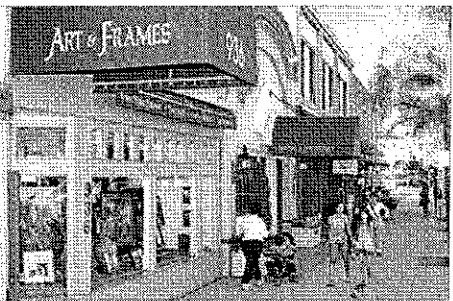


Building details such as recessed windows and entries can add depth and solidity to a building's façade

See Also  
"Pedestrian Sidewalk Zones"  
on page 65



Architectural details highlight a building's primary entrance in La Mesa



Ground floor retail windows in Coronado activate the pedestrian realm

#### 4.1.5 Entries and Ground Floor Activities

Buildings should be designed so that all of their entries are easy to find. This is particularly important for mixed-use buildings, which generally should include ground floor uses that encourage pedestrian activity.

- ♦ Accentuate all entries with features such as moldings, lighting, overhangs or awnings.
- ♦ Accentuate primary building entries with strong architectural definition such as recessed entry bays, in order to create transitional spaces between the building and street.
- ♦ Locate residential entries on the front façade of buildings and provide direct access to the sidewalk or street.
- ♦ Locate public and publicly-oriented uses on the ground floor of buildings to encourage pedestrian activity.
- ♦ Where adequate sidewalk space exists, design doors or sliding windows that enable ground floor restaurants and retail to expand onto the sidewalk.
- ♦ In buildings with a vertical mix of uses, reserve the ground floor for activity-generating retail storefronts. Locate residential uses on upper floors

#### 4.1.6 Windows


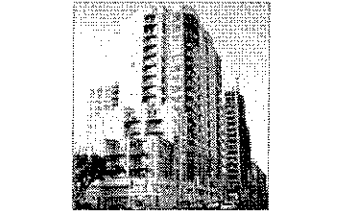
Windows can enliven the pedestrian environment and provide opportunities for ground floor businesses to be seen by passersby.

- ♦ In buildings containing retail, commercial, community-serving or other active uses, position windows for visibility by both pedestrians and motorists at street level.
- ♦ Include façade openings and windows that are vertically proportioned, with a greater height than width. Appropriate height-width ratios typically range from 1.5:1 to 2:1.
- ♦ Maintain a minimum of 60 percent of the ground floor linear dimension as evenly distributed display windows.
- ♦ Use clear glass in ground floor windows and doors of all commercial businesses to promote visibility into the ground floor space.
- ♦ For ground floor retail windows, utilize a larger window proportion than for upper floor windows.
- ♦ Enhance upper story windows with architectural details such as sills, molded surrounds and lintels.
- ♦ Where possible, employ operable windows to take advantage of breezes and reduce energy costs.
- ♦ In fire hazard areas, use smaller windows on any side of a building that faces an area with high fire risk.

## Residential Building Types in Smart Growth Areas

Table 4-1 shows the types of residential buildings that are typically most appropriate in Smart Growth Areas. Building types should be chosen based on the anticipated housing needs of a community, as well as SANDAG's density targets for each Smart Growth Place Type.

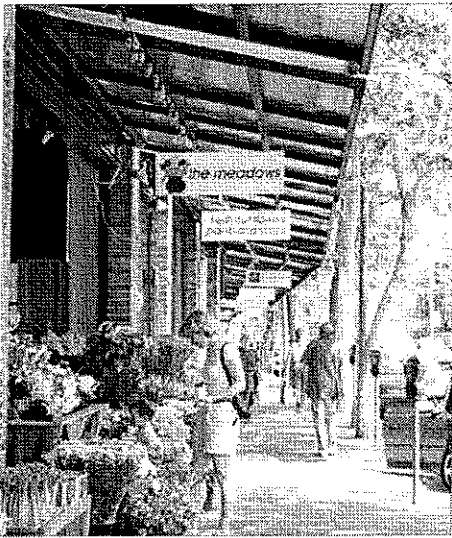
**Table 4-1 Residential Building Types**

Building Type	Typical Net Density	Typical Square Footage	Typical Bedrooms	Typical Height and Construction Type	Typical Parking
 <p>Small-Lot Single Family Home</p>	8 to 20 du/ac	800 to 1,200	1 to 2	2 to 3 stories, wood frame	Attached or detached garage and/or driveway
 <p>Townhouse*</p>	15 to 40 du/ac	800 to 1,600	1 to 3	2 to 4 stories, wood frame	Tuck-under garage
 <p>Low-Rise Apartments / Condominiums**</p>	20 to 75 du/ac	800 to 1,600	1 to 3	2 to 4 stories, wood frame	Tuck-under garage and/or surface lot; potential for structured parking
 <p>Mid-Rise Apartments / Condominiums**</p>	50 to 125 du/ac	800 to 1,600	1 to 3	3 to 5 stories, concrete podium with wood frame	Structured parking
 <p>High-Rise Apartments / Condominiums**</p>	100+ du/ac	800 to 1,600	1 to 3	7+ stories, steel and/or concrete frame	Structured parking

\* Townhouses can be combined with apartments and condominiums, either on the ground floor or on upper stories

\*\* These building types also support mixed-use development with commercial uses on the ground floor

Adapted from Metropolitan Transportation Commission 2007 *Station Area Planning Manual*



Awnings can complement the character of buildings while providing functional benefits, as shown in this example from Oakland, California.

#### 4.1.7 Awnings, Canopies and Arcades

Awnings, canopies and arcades provide shade and cover from the elements and help to reinforce the pedestrian scale.

- ♦ Design awnings, canopies and arcades to be consistent with the character of the building.
- ♦ Design arcades to provide at least ten feet of clear space between the building façade and the edge of the arcade, so that there is adequate space to walk along the arcade as people enter and exit buildings.
- ♦ Design awnings and canopies to provide a minimum clearance of eight feet between the sidewalk and the bottom of the canopy or awning valance.

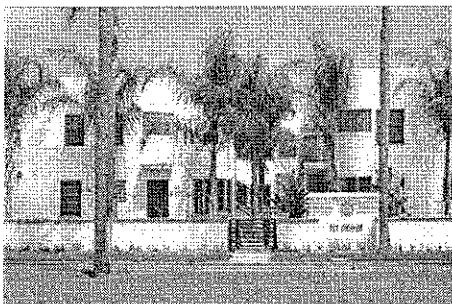


Changes in color help to distinguish different parts of this building in San Diego.

#### 4.1.8 Building Color and Materials

Visually appealing buildings typically incorporate a limited number of complementary colors and materials.

- ♦ Where one building material is used to simulate another, use it in a way that is in keeping with the character and properties of the material being simulated.
- ♦ Where the building includes accent materials such as metal and wood, incorporate these materials on all façades of the building, not just the front façade.
- ♦ Limit the colors and materials used on the exterior of a building to an appropriate and varied palette.
- ♦ Allow building exteriors to use innovative new materials, or to use traditional materials in unconventional ways, as long as these innovative treatments fit the desired character for the neighborhood.
- ♦ In fire hazard areas, use fire-resistant materials such as stucco, stone or tile on the exterior of buildings.
- ♦ Use changes in color as well as materials to differentiate between different components of a building.
- ♦ Consider applying different colors and materials on the upper floors of taller buildings, to help differentiate between the building's base, body and top.

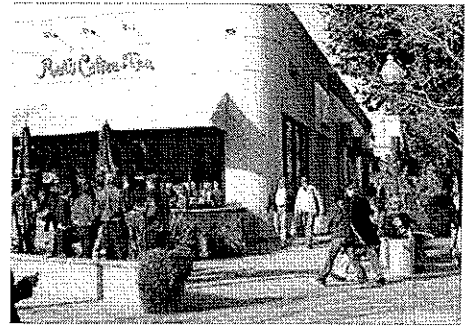


The materials and colors of this building in Coronado reflect local architectural character.

### 4.1.9 Universal Access

Buildings and their entrances must provide access for individuals of all levels of mobility.

- ♦ Design the main entrance of a building so that it is accessible to all people, regardless of their level of mobility.
- ♦ Where a person must change direction as they approach a building's entrance, provide at least 60 inches of clear space for turning.
- ♦ Provide a pedestrian path width of at least 36 inches leading to the building's entrance.
- ♦ Incorporate levers, U-shaped handles or door pulls, or magnetic push-release hardware on doors, so that they can be opened without grasping or twisting movements.



In this example from Berkeley, California, a ramp with a gentle slope provides a transition from the sidewalk to shops located above it.

## 4.2 Resource Conservation

Design solutions should incorporate strategies to conserve resources during both construction and operation of the building.

### 4.2.1 Water Conservation

There are numerous systems for conserving water that can be incorporated into the design of new and newly-renovated buildings.

- ♦ Employ rooftop catchment systems to collect rainwater for reuse as a supplemental landscape water supply.
- ♦ Establish “greywater” plumbing systems in new buildings where practical, in coordination with local health standards. Greywater is previously used water from washing machines, dishwashers and other on-site uses that can be collected and reused for limited purposes, such as watering plants and flushing toilets.
- ♦ Install low-water-use fixtures and appliances in all new and renovated buildings.

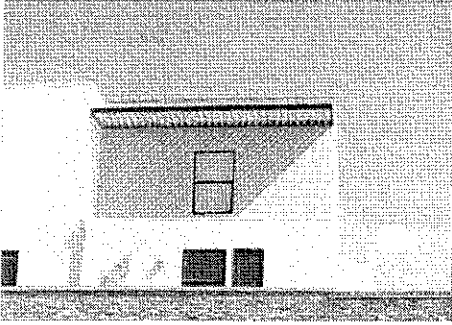
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#### See Also

“Energy Conservation and Landscaping”  
on page 42

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See Also  
"Energy Conservation and Landscaping"  
on page 42



A projecting feature on this building in Emeryville, California provides shade for a window

#### 4.2.2 Energy Conservation

Sustainable building design features can help buildings to conserve energy. This is particularly true in the San Diego region, where there is very little rain and ample exposure to sunlight throughout most of the year. Energy conservation techniques can be tailored to the climate of the San Diego region to minimize the energy needed for heating, cooling and ventilation.

- ♦ Maximize the number and size of north-facing and south-facing windows. Use smaller and fewer windows on the east and west sides of the building.
- ♦ Minimize direct sunlight by incorporating strategically placed overhangs, louvers or similar shade-producing features.
- ♦ Provide fully operable windows that can be adjusted throughout the day for maximum ventilation.
- ♦ Design building interiors to take advantage of natural ventilation by orienting rooms so that breezes can blow through them.
- ♦ Properly insulate and seal all new and renovated buildings to contain and extend the climatic influence of heated or cooled air.
- ♦ Use energy-efficient heating, ventilation and cooling systems that regulate the interior temperature of buildings throughout the day.

#### 4.2.3 Materials Conservation

Cost-efficient and sustainable construction materials and practices should be utilized in all development.

#### Green Building Certification

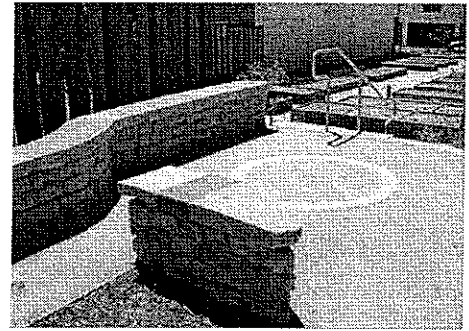
The United States Green Building Council (USGBC) initiated its Leadership in Energy and Environmental Design (LEED) Green Building Rating System in 1998. The system encourages sustainable building practices through a universal certification process, in which buildings are scored for their on-site sustainability, water efficiency, energy conservation, materials, indoor environmental quality and design innovation. LEED-certified developments have positive environmental, financial and political benefits for the communities that support them.



LEED-certified development can have both financial and environmental benefits

Another popular certification system for green buildings is Build it Green's GreenPoint Rated, which provides guidelines for single-family and multi-family residential construction. Many cities have also chosen to develop their own system for rating green buildings, which requires more work by the local jurisdiction but makes it possible to tailor the system to local conditions.

- ◆ Where feasible, reduce waste and minimize use of new resources by renovating or adding to existing buildings rather than building new structures.
- ◆ Use “rapidly renewable” materials such as bamboo, engineered lumber and paper-based cellulose where appropriate.
- ◆ Use high-quality materials to reduce maintenance and replacement costs.
- ◆ Use recycled construction materials, such as cellulose insulation, recycled carpet and recycled glass, for at least 5 percent of the project’s materials.
- ◆ Use locally manufactured building products to reduce transportation impacts and costs and support local industry.
- ◆ Sort demolition debris and construction waste on site, for delivery to recycling centers, in order to ensure that materials are being recycled. Divert at least 50 percent of these materials to recycling centers.



Recycled construction materials, shown here in an example from San Francisco, California, can be attractive, affordable and environmentally friendly.

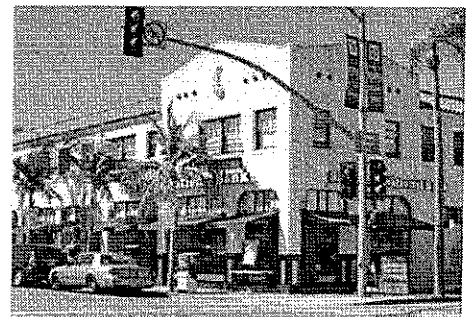
#### 4.2.4 Adaptive Reuse

Adaptive reuse is the practice of reusing existing buildings for new uses while preserving some or all of the building’s structural elements or architectural features. Adaptive reuse helps to conserve natural resources by reducing the need to use new materials for construction. In addition, adaptive reuse of historic structures can preserve history and reinforce neighborhood character and identity.

- ◆ Reuse buildings that can accommodate a modern development program and help to achieve a long-term vision for the neighborhood.
- ◆ Determine the best possible new uses for existing buildings with respect to their contribution to neighborhood character, economic feasibility, economic revitalization and interior conversion potential.
- ◆ When adaptively reusing historically significant buildings, preserve the defining historic features of buildings wherever possible.
- ◆ Ensure that parking standards provide flexibility for adaptive reuse, using measures such as counting on-street parking spaces towards minimum parking requirements, providing shared public parking areas, and allowing developers to pay in-lieu fees for parking.

#### See Also

Chapter 9: Parking



This building in San Diego is a successful example of adaptive reuse.

#### LEED for Neighborhood Development (LEED-ND)

The United States Green Building Council (USGBC), with support from the Congress for the New Urbanism (CNU) and Natural Resources Defense Council (NRDC), has developed a rating system for green neighborhood design. Building on the Leadership in Energy and Environmental Design (LEED) rating systems that already exist for individual buildings, LEED-ND emphasizes principles that tie buildings, public infrastructure and open spaces together into neighborhoods. It is designed to be applied to new neighborhoods that have a variety of different scales.

LEED-ND rates new neighborhoods based on their location and relationship to existing development, infrastructure and natural features; their overall design and land use mix; and their ability to support a variety of transportation and housing options. Additionally, a neighborhood will receive a higher rating if its buildings reflect green building and site design principles.